pody, locally called rock fern. Considerable fruitless search was made among such colonies for marked variations in leaf form.

Polystichum acrostichoides. Comparatively infrequent. Many of the wooded slopes are apparently too damp for it.

Pteridium aquilinum. Abundant on cleared neglected banks or competing with berry bushes.

BROOKLYN, N. Y.

The Ferns of the Lake George Flora, New York

I.

STEWART H. BURNHAM

The region covered by the so-called Lake George Flora includes the counties of Washington, Warren and Saratoga. Three additional records in the counties of Essex and Hamilton are also given. The altitude at Waterford and for some distance up the Hudson river is but 100 feet above the sea; also South Bay and lower Lake Champlain is 101 feet. Black Mt. on Lake George, 2665 feet, is the highest land in Washington county. Crane Mt., 3254 feet, and Gore Mt., 3595 feet, are well known peaks in Warren county. Several other peaks in northwestern Warren county are over 3000 feet; but Gore Mt. is the highest land in the region.

The rocks composing the mountains are largely of a granitic gneissoid nature. Chazy limestone, appearing in the vicinity of northwest Hartford, extends through the town of Kingsbury to Glens Falls, where it is known as Trenton limestone or black marble. Slates occur along the eastern side and in southern Washington county; also along the banks of the Hudson river from Glens Falls to Waterford and along the Mohawk river. Considerable sandy soil is found in Saratoga county and a few sandy tracts in Warren and Washington

counties. Clay soils occur, specially along and near the larger streams and in the Champlain valley. Much of the soil of the lowlands was deposited when the Laurentian glacier covered the region.

I began to study the ferns of this flora in 1889. Many other botanists have collected in the region, specially about Lake George. Dr. E. A. Burt collected a few ferns about East Galway, Saratoga Co., about 1880: these are preserved in his herbarium. Mr. W. N. Clute collected and observed several ferns, July, 1908, at Round Lake. Mr. and Mrs. Edward Cornell collected ferns, in 1909, near their home in Cambridge. Mr. Frank Dobbin has collected near Shushan. Mr. Wallace Greenalch, in 1900, collected ferns near Schuylerville. Dr. Chas. H. Hall collected ferns at Lake George (probably near Bolton) in 1876: these are preserved in the Herbarium of the Brooklyn Botanic Garden. Dr. Geo. D. Hulst collected at Lake George, in the vicinity of Assembly Point, from 1892 to 1900: at the time of Dr. Hulst's demise, the ferns were retained by Mrs. Hulst, although Dr. Hulst's other collections are preserved in the Herbarium of the Brooklyn Botanic Garden. A few of Dr. Hulst's ferns may be found in the N. Y. State Herbarium at Albany. Dr. Smith Ely Jelliffe collected ferns about Huletts Landing, Lake George, in 1886, and afterwards: these are preserved in his herbarium. Prof. James F. Kemp collected about Silver Bay, Lake George, in 1900 and 1902. Dr. Chas. H. Peck collected ferns in the territory; these are preserved in the N. Y. State Herbarium. Mr. Frank T. Pember has collected near Granville. Mrs. S. W. Russell collected ferns near Hillview, Lake George, in 1910. Mr. Frank G. Taylor, in 1908, collected near Easton. Mrs. E. Watrous has found interesting ferns near Hague, Lake George. Prof. C. L. Williams has collected at Lake George; and has a fern garden in Crandall park, Glens Falls.

More thorough search will undoubtedly bring to light, perhaps additional species, and many interesting forms, especially among the mountainous districts of Warren and Saratoga counties, where the flora has received but very little attention and study.

Ophioglossaceae

OPHIOGLOSSUM VULGATUM L.

Dry pastures, rarely in swales, bogs and woods; infrequent. June–August.

Glens Falls (Mrs. L. A. Millington) in correspondence with Mr. Wm. H. Leggett, June 19, 1872, says: "*Ophioglossum vulgatum*, I find in nearly every swampy bit of grass"; Assembly Point, Lake George (G. D. Hulst); Hague (Mrs. E. Watrous); Comstocks (J. F. Kemp); Granville, "rather common" (F. T. Pember); Baker farm near Schuylerville (Wallace Greenalch); New Michigan Pond marsh, W. Fort Ann, Nov. 3, 1900, two small sterile plants growing in sphagnum; southeast of Tripoli; Vaughns; bog north of Round Lake; low meadow south of Shushan near the Fly Kill.

This fern prefers to grow about little knolls of stony sandy and silt loam at Vaughns; and is usually overlooked on account of its small size. It varies from a few inches to a foot in height and has from one to three fruiting plants from the same rootstock, more than one when the plants are somewhat gregarious. Dry successive seasons tend to kill it out. It grows quite luxuriantly, between the tussocks of a swale of *Carex stricta*, about a mile east of Vaughns corners, on the north bank of South Beaver creek.

BOTRYCHIUM SIMPLEX E. Hitchcock

Dry woods; very rare.

Woods of sugar maple and hemlock, about half a mile west of Vaughns schoolhouse, June 23 and July 12, 1896 (a portion of the sterile frond fruiting in one or

two specimens); June 10, 1897 (unrolling); July 11, 1899. Palmertown mountains, east of Brayton, Lake George, top of the ridge, June 16, 1897; a single plant with the sterile segment 9-lobed and long petioled. Sugar maple woods east of Tripoli schoolhouse, July 13, 1897.

Probably often overlooked because of its small size. The specimens have been verified by Miss Margaret Slosson.

BOTRYCHIUM NEGLECTUM Wood

Mixed woods of hemlock and hardwoods; and moist ravine beds in mountain woods; scarce. May 25–July 25.

Burnt Hill, Assembly Point (Hulst); Whitehall (C. H. Peck); Mt. Hope, Putnam mountains; the falls in West Brook and near Three Ponds, W. Fort Ann; Vaughns, sometimes under the deep shade of small hemlocks; north of Round Lake.

The glaucous plants vary from a few inches to a foot in height. The larger plants are quite fleshy; the sterile segment is divided into 7–11 divisions; the fertile, 2–3 pinnate and much branched.

BOTRYCHIUM OBLIQUUM Muhl.

Dry woodlands and pastures; frequent. Aug.–Nov.

Lake George (C. H. Hall); Fishbrook Pond, Lake George (S. E. Jelliffe); Silver Bay & Sabbathday Point, Lake George (Kemp); Assembly Point (Hulst); "The dwarf form of var. *obliquum* with the sterile frond about one inch broad and long and the whole plant three or four inches high was found at South Corinth." (Peck) in N. Y. State Mus. Report **32:** 54. 1879; Shushan (Frank Dobbin), also in the bog north of Clarks Pond; Warrensburg; W. Fort Ann; Vaughns; northwest Hartford; and elsewhere. The dwarf form has been found in mossy woods west of Pattens Mills church and in other low woods.

An extremely variable species as to size, and the shape and cutting of the evergreen sterile frond.

BOTRYCHIUM DISSECTUM Spreng.

Dry pastures and open woods; scarce.

Vaughns; west of Kingsbury; southern W. Fort Ann; east of Fort Ann.

Usually associated with *B. obliquum* and intermediate forms are found approaching that species. The sterile frond is laciniate or finely dissected and varies in texture, the more typical plants being quite thin.

BOTRYCHIUM MATRICARIAE (Schrank) Spreng.

"South Corinth. August." (Peck) in N. Y. State Mus. Bull. **67:** 21. 1903; Vaughns, rare.

BOTRYCHIUM SILAIFOLIUM Presl

Assembly Point (Hulst); Vaughns, Sept. 30, 1903, det. B. D. Gilbert. This fern, formerly known as *B. ternatum*, var. *intermedium*, grows with *B. obliquum:* and matures its fruit two or three weeks earlier than that species.

The large form of *B. silaifolium*, known as *B. obliquum Habereri* Gilbert, was collected in open woods at Vaughns, Sept. 30, 1903. These specimens were referred to this variety by B. D. Gilbert, who said, this was the form Prof. Eaton years ago referred to Robert Brown's *B. australe.* This large form has also been found at Silver Bay (Kemp); northwest Hartford; north of Hudson Falls; and near Fort Edward reservoir.

BOTRYCHIUM VIRGINIANUM (L.) Sw.

Moist rich woods; not uncommon. June–Aug.

A plant, at Vaughns, was collected June 17, 1904, which was 31 inches high; with the fertile part 8 inches long and the sterile segment 16 by 9 inches. The young plant begins to unroll about the middle of May.

Variable as to the size of the plants; the smaller ones approaching *B. gracile* Pursh. This fern, John Robinson tells us, "never spreads except by spores, hence is not found abundant in one locality."

HUDSON FALLS, N. Y.

(To be continued)

Notes and News

NOTES ON FERN LITERATURE

MAXON, WM. R. Contrib. U. S. Nat. Herb. **17:** I–VIII & 541–608. pl. 32–43. 23 May 1916.

In the sixth installment of his Studies of tropical American Ferns cited above, Maxon deals mainly with three groups of *Polypodium*, respectively the groups of *P. trichomanoides*, *P. furfuraceum*, and *P. squamatum*, comprising sixty-four species accepted as valid and more than twenty-five additional forms. In addition the identity of several species of *Notholaena* is also dealt with. Most of the species of *Polypodium* are small forms of the West Indies, Central and South America. The paper includes sixteen new species of *Polypodium*, and two new species in *Notholaena*.

Of particular interest are the characters used in separating the different species, and the conclusions expressed or understood, which may be drawn from the results.

Characters of the scales of the rootstocks and leaves are given more weight than characters of venation, i. e., the actual structure of the individual scale as seen through a microscope. The presence of a large number of scales, as compared with the almost complete absence of scales, is not counted as significant, provided the scales in both cases show similar cell structure. It is found, however, that two forms which in general ap-